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The profile of students' eco-literacy at nature primary school

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Abstract

Eco-literacy play a crucial role in instilling awareness in children about the importance of protecting the environment. The purpose of this study was to describe the profile of nature school students' eco-literacy. The research method used qualitative research with a case study approach. The research subjects were selected through the purposive sampling technique. Data collection techniques in this study were questionnaires, observation, interviews, tests, and document study. The data analysis technique employed in this study was the interactive data analysis technique. The results revealed that: (1) cognitive aspects were quite good, indicated by a systematic understanding of nature; (2) emotional aspects were good, shown by high caring and empathy; (3) spiritual aspects were good, indicated by the attitude of respecting nature; (4) high activity aspects, shown by ability to apply ecological knowledge into life practices. This research concludes that the profile of eco-literacy in nature school was quite good.

Keywords: Eco-literacy, nature school, primary school

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1. Introduction

Environmental damage is increasing day by day. It is due to human behavior that exploits natural resources excessively and does not pay attention to environmental renewal. Hence, it is necessary to understand ecosystems' principles and use these principles to form a sustainable society called eco-literacy (Nurfajriani et al., 2018). Eco-literacy must be owned by every individual. Individuals who have eco-literacy will be able to harmonize development growth with the environment to create a harmonious environment between society and the environment (Agsari et al., 2018). Rosyid et al. (2019) also stated that eco-literacy is needed to produce residents who have knowledge of environmental biophysics and related problems, build awareness and participation in overcoming environmental problems, and motivate them to find solutions to these problems. Eco-literacy itself is an ability that each individual must have to adapt to the ecology where the individual is located (Goleman, 2010). Eco-literacy is a process of increasing understanding, knowledge, attitudes, and behavior based on ecology. Eco-literacy seeks to introduce and renew one's understanding of the importance of global ecological awareness to create a balance between society's needs and the earth's ability to sustain them (Sapanca & Etmagusti, 2012; Sartika et al., 2014). In short, eco-literacy is defined as the ability to understand the ecology and overcome environmental problems for the sake of the sustainability of human life (Pilgrim et al., 2007; Suryanda et al., 2019). Furthermore, eco-literacy is considered as a guideline for measuring the individuals' ecological knowledge, ability, and willingness to use ecological standards in implementing a sustainable lifestyle (Monaghan & Curthoys, 2008) to create a balance between human needs and the sustainability of the earth that supports it (Pitman & Daniels, 2016).

Several attitudes describe a person's eco-literacy ability, including sensitivity or empathy to the environment, being responsible with his group friends, following the steps, procedures, or rules in a system, being fully responsible for his work, and being aware of environmental management (Goleman, 2010; Rusmana & Akbar, 2017). According to Capra (2007), the eco-literacy aspects are the principles of living systems, design inspired by nature, systems of thought, ecological paradigms and transitions for sustainability, collaboration, and building community and citizenship. Then, McBeth & Volk (2010) presented four components of eco-literacy: (1) foundational ecological knowledge; (2) environmental affect-verbal commitment, environmental sensitivity, environmental feeling; (3) cognitive skills-issue identification, issue analysis, action planning; (4) behavior-actual commitment, i.e., pro-environmental behavior. On the other hand, Okur-Berberoglu (2018) classifies eco-literacy into five sub-sections: ecological intelligence, social intelligence, emotional intelligence, economy, and green consumer behavior. The eco-literacy aspect used in this study refers to the literacy components proposed by the Center for Eco-literacy (2013), namely cognitive (head), emotional (heart), spirit (connection), and activity (hand).

First, the cognitive aspect of eco-literacy is the ability to identify and define environmental problems/issues and analyze them; synthesis and evaluation of information about these problems use primary and secondary sources and one's personal perspective (Hollweg et al., 2011). According to McBride et al. (2013), the cognitive eco-literacy ability is the ability to choose the right strategy or action and create, evaluate, and carry out actions from the plans that have been designed. On the other hand, cognitive abilities in eco-literacy are also defined as the ability to carry out scientific investigations and analyze environmental risks scientifically and think systematically, predictively, progressively, and innovatively (Muthukrishnan, 2019). Knowledge in eco-literacy itself is all information that provides facts about the environment and natural balance. An ecologically intelligent person has knowledge of the importance of understanding the relationship or interrelation between

one group and other components and being concerned about a job. It means that ecologically literate someone knows how to relate and behave with the ecosystem (Schimek, 2016). According to Moskaliuk et al. (2017), the cognitive aspect of a person is vital. It is because if someone does not master and understand information related to the environment and natural balance, various forms of action and decision-making that damage the environment can increasingly occur.

Second, the emotional aspect is the ability to manage feelings, the ability to perceive situations, act in accordance with these perceptions, and determine a person's potential to learn practical skills based on self-awareness, motivation, self-regulation, empathy, and skills in building relationships with others (Yuksekbilgili, Akduman & Hatipoglu, 2015; Serrat, 2009). According to Fiori & Maillefer (2017), the emotional aspect is the ability to feel, understand, and effectively apply emotional power and sensitivity as a source of human energy, information, connection, and influence. Furthermore, Lobaskova (2015) affirms that people who have good emotional aspects have the ability to be aware of their own emotions and the emotions of others.

Emotions affect a person's behavior, such as strengthening or discouraging enthusiasm, disrupting learning concentration, and influencing a person's social adjustment and attitudes (Ebinagbome & Nizam, 2016). It is in accordance with Kant's (2019) opinion, stating that emotions could influence individual behavior. In line with the above opinion, MacCann et al. (2020) also revealed that students with good emotional aspects were more likely to determine the success of building their knowledge and reducing self-aggressiveness. The emotional aspect in this research is the ability to feel caring, empathy, and respect for other people and living things, understand and appreciate various perspectives, work and respect other people with different backgrounds, motivations, and intentions, and committed to equality, fairness, inclusiveness, and respect for all people.

Third, the spiritual aspect is the ability to face and solve problems of meaning and value, namely intelligence to place behavior and life in a broader and richer context of meaning, in other words, intelligence to judge that one's actions or way of life are more meaningful (Vokey, 2001; Yocum, Densmore-James & Staal, 2016). The spiritual aspect makes human beings who are truly intellectually, emotionally, and spiritually intact, and it can bridge themselves and others. It is because spiritual intelligence makes humans better understand their self-identity and meaning for themselves and understand how they can give a meaningful place to themselves or other people or the environment. Thus, in the end, these meanings will educate and form a person who has good character, has a complete ethic, and manifests in everyday life, whether social, family, or to face ordinary problems to severe problems, such as suffering (Arweck & Nesbitt, 2007; Pandya, 2017). Preston (2012) adds that the spiritual aspect is the ability of a person's soul to develop himself through various positive activities to solve problems and face challenges through the meaning of them. The spiritual aspect in this research is the ability to respect the earth and all living things, admire nature, be close to the natural world, and use that feeling to others.

Fourth, the activity aspect in eco-literacy is the ability to create and use tools, objects, procedures needed by the community, turn beliefs into practical and effective actions, apply ecological knowledge into life practices, and assess and adapt the use of energy and natural resources (McBride et al. al., 2013). The active participation of students in eco-literacy is aimed at solving problems and environmental problems. For example, action through certain lifestyle activities includes environmentally sound consumer purchasing, using methods to conserve resources, assisting with environmental regulation, using personal and interpersonal means to promote environmentally sound practices, and supporting environmentally sound legislative initiatives and policies (Alexandar & Poyyamoli, 2014; Veselinovska & Osogovska, 2012). Eco-literacy activity refers to enacting the

psychomotor domain to develop practical learning skills and work with the physical, such as building, planting, improving the environment, etc. (Singleton, 2015). The students' active involvement is needed in the context of implementing environmentally-friendly behavior. A meaningful educational experience has the potential to excite student activities towards loving the environment (Jagannathan, Camasso & Delacalle, 2018). It is supported by the opinion of Locke, Russo & Montoya (2013) that to increase student eco-literacy activities, learning needs to include real-life problems that students must solve, student-centered learning, group interactions, and authentic assessments that measure student progress.

Based on the explanation on the importance of eco-literacy aspects above, it can be concluded that eco-literacy must be instilled from an early age. It is in line with Agra's (2018) opinion, which states that eco-literacy is part of early childhood education. It is because eco-literacy plays a crucial role in instilling awareness in children about the importance of protecting the environment and forming social awareness and sensitivity to the surrounding environment so that environmental damage can be prevented. It is also reinforced by Desfandi, Maryani & Disman (2017) and Locke, Russo & Montoya (2013), who assert that eco-literacy is an aspect of concern in the field of education because eco-literacy education can form future generations who are independent and active in conserving resources to develop or make regulations based on environmental, economic, and community conditions. Orr (2011) suggest that eco-literacy is essential to be developed in the learning process because school graduates will act as 1) agents of change in society, namely agents in developing community behavior who have knowledge, insights, attitudes, and behaviors that uphold sustainability, 2) agents who are aware of limited natural resources and the issue of global warming, and 3) agents who can apply eco-literacy or learning applications that are eco-pedagogic in life.

The importance of developing children's eco-literacy through the education level supports the emergence of schools that carry the theme of being close to nature, one of which is nature schools. Nature schools are outdoor learning initiatives as tools for learning and development (Coates & Pimlott-Wilson, 2018). Through the nature school, students are given the opportunity to explore open nature. They will learn how to deal with risks and challenges in the open nature in their style (Harris, 2015). It is in agreement with Leather (2016), who states that nature schools provide stimulation of imaginative play when playing in the open nature so that students who attend nature schools feel more independent and have a greater sense of personal, social, and environmental responsibility. Nature schools encourage students to think creatively to get out of their comfort zone, take risks, and cooperate with their peers. They also feel more physically active while in nature school because they learn to move safely in areas that are difficult to predict and challenging (Barrable & Arvanitis, 2019). The nature school in its ideal form is a practical answer to ecological inequality.

One school that has implemented eco-literacy is the Bengawan Solo Nature School (SABS). Unlike other nature schools, this school occupied an unspoiled nature, not creating nature in the school environment. The implementation of eco-literacy at SABS could be seen from the curriculum, learning, and activities. The SABS curriculum was divided into four pillars, each of which had eco-literacy values. The four pillars were the moral curriculum with exemplary methods, the cognitive curriculum, which is a science with the action learning method to learn with nature, the leadership character curriculum with the outbound training method, and the business mental curriculum with business methods from the results of internships and learning from experts (learn from maestro). SABS activities that facilitated student eco-literacy varied, such as Outbound, Leadership Training, Night Camp, OTFA (Out Tracking Fun Adventure), Outing Class, Science Project for the Environment, etc. In contrast to SABS, the Baturraden Nature School (SABar) had a location setting in the resin tree forest, an upland area in

Baturraden, Banyumas. SABar education's goal focused on core values, including soulful, moral, beyond, achieve, and responsible by making educators facilitators for children. SABar used a curriculum of four pillars of value dimensions, comprising the philosophy of science curriculum, the *akhlakul karimah* (Noble Characters) building curriculum, the leadership curriculum, and the entrepreneurship curriculum. Another distinctive feature of SABar was maximizing the involvement and use of the natural environment and parents' role as educational partners.

Therefore, based on the explanation above, this study aims to describe learning that has an impact on the eco-literacy of nature school students. It is due to the lack of literature on eco-literacy learning in elementary schools. This study's results can be used as an overview and guidelines for eco-literacy learning, especially at the level of primary school students.

2. Methods

2.1. Research Design

The research method used was qualitative research. Qualitative research is research used to describe and analyze phenomena, events, social activities, attitudes, beliefs, perceptions, and people individually or in groups (Williams, 2007). This qualitative research was the most suitable because the researcher wanted to emphasize the process and a detailed description of the problems regarding eco-literacy learning in primary schools. The form of this research was a case study. Case study research aims to explore problems with certain limitations, retrieve data in-depth, and include informants (Baxter & Jack, 2010). In qualitative research, researchers position themselves as a key instrument, which means that researchers collect their research data through document study, behavioral observation, and in-depth interviews (Miles & Huberman, 2014).

2.2. Sample

The subjects of this study involved the principal, teachers, and all students of the Bengawan Solo Nature School and the Baturaden Nature School. The research subjects who were used as informants were considered through purposive sampling techniques. Informants were selected because of particular characteristics based on the theoretical concepts used, personal curiosity, and empirical characteristics (Tongco, 2007). The reason the researcher chose Bengawan Solo Nature Primary School and Baturaden Nature Primary School as research sites were, among others, because of (1) easy licensing, (2) the availability of research subjects to be involved in the research, (3) this school was established for humanitarian reasons (there are still many students who drop out schools because of costs), and concern for the environment (the condition of the Bengawan Solo River which is concerning and the environment of the neglected forest), and (4) the location of the school was quite strategic and still in a beautiful natural environment.

2.3. Data Collection Techniques

Data collection techniques in this study were questionnaires, observation, interviews, tests, and document study. The questionnaire disseminated in this research was in the form of statements relating to emotional and spiritual aspects. It was enough to fill in this questionnaire by placing a checkmark in the "Yes" column if students agreed with the statement and placed a checkmark in the "No" column if students did not agree. Students were asked to fill in the 20 points of the eco-literacy questionnaire statement. Then, observations were made as an effort for the researcher to collect data

and information from primary data sources by optimizing the researcher's observations that involved listening, reading, smelling, and touching activities. Observation techniques were employed to obtain complete and detailed student eco-literacy activity data regarding direct conditions based on direct observations in the field (Debby, Stokes & Peter, 2010). The observation technique utilized in this research was a non-participant observation, in which the researcher acted as an observer and did not engage in the activity being observed. The researcher observed the low and high classes to determine the learning process between the two class levels.

The researcher's interview technique was an in-depth interview technique to obtain more detailed, valid, and detailed research data. Besides, the in-depth interview technique allows for a harmonious relationship between the researcher and the resource person (Jamshed, 2014). The stages of in-depth interviews, according to Boyce & Neale (2006), are starting from determining suitable sources, making interview indicators, preparing interview data collection tools, making interview guidelines, making arrangements for a place and time to conduct interviews, recording all interview data obtained, transcribing all interview data into written form, making observations in writing, and analyzing the results of interviews obtained. Then, the researcher distributed the eco-literacy test instrument to students of the Bengawan Solo Nature Primary School. This question contained five essay items. The questions given were related to eco-literacy learning. The researcher could find out the students' eco-literacy abilities from the answers given. The researcher employed this documentation study to complete the data. Documents are records of events/incidents that have passed in the form of writings, pictures, or someone's work (Bowen, 2009). Through these documents, it was hoped that they could become a source for answering not possible questions to ask through interviews or observations so that the use of this document study technique helped in the process of validating the data obtained before data analysis was carried out.

2.4. Data Analysis Technique

The data analysis technique utilized in this study was the interactive data analysis technique of Miles & Hubberman (2014), consisting of data validating, data collection stages, data reduction, data presentation, and conclusion drawing. The validity of the data was carefully considered to prove that the study is scientific research in which the data are based on reality and are credible, representative, and appropriate (Whittemore et al., 2001). Triangulation was used to increase the trustworthiness of the study. The triangulation employed in the study is the method triangulation and source triangulation. The source triangulation is to collect data from multiple data sources, such as teachers, principals, and parents. In addition, the method triangulation is to collect data by using multiple methods of data collection such as interviews, observation, questionnaires, and document analysis to obtain complete data.

Data collection was done by collecting observational data, in-depth interviews, and document studies. The data obtained in the study were checked and tested for their validity first to be accounted for and serve as a strong basis for drawing research conclusions. In this study, the technique used to test the data's validity was triangulation, which covered the triangulation of sources, techniques, and time. Source triangulation was carried out by comparing data based on interviews with information sources, namely students, teachers, and school principals. Technique triangulation in this study served to validate the data obtained by using several different data collection techniques against the same source. From some data obtained through various data collection techniques, the results were then compared with other techniques and conclusions drawn to obtain more substantial data validity. Finally, time triangulation in this study was employed to obtain credible data because by using this

method, patterned or repetitive data could be obtained so that the data's credibility level could be determined or decided.

At the data reduction stage, there was a process of selecting, concentrating attention, simplifying, and transforming the rough data that emerged from field notes obtained by researchers- in each research cycle carried out. After the data obtained from the field were sorted into essential parts, they were separated according to categories (between uppercase, lowercase, numbers) and discarded data that was not used. Then, these data could be presented in the form of tables, graphs, or diagrams. Therefore, through the data presentation, the data could be organized and arranged in a relationship pattern so that it was easier to understand. The conclusions were drawn in stages. The initial conclusions put forward were still provisional. Through analysis conducted by the researcher from various data obtained, conclusions could be drawn in response to the problem formulation. The results of this conclusion were used as a result of the report on the research implementation.

3. Results and Discussion

3.1. Cognitive Aspect

Based on the eco-literacy evaluation test results, it was found that 23.75% or 19 students got the criteria for low eco-literacy ability, 50% or 40 students were categorized as moderate, and 26.25% or 21 students were classified as high. The average test score of students was 80.5, with the category of moderate eco-literacy ability. The lowest score was 60, and the highest score was 100. The summary of the evaluation test results can be seen in the following figure.

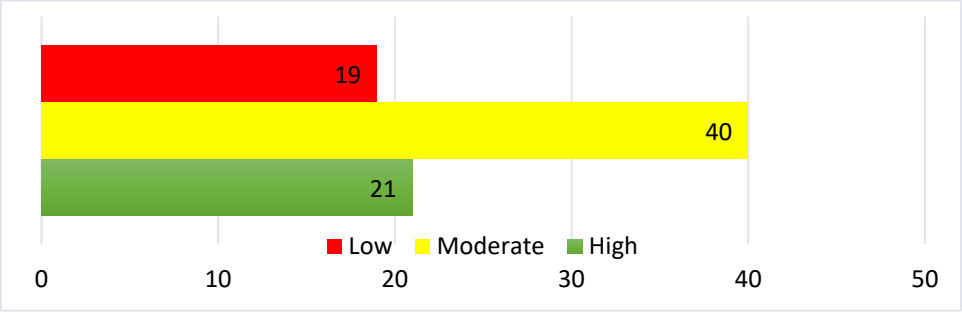

Figure 1. Student ecoliteracy evaluation test results

The facts based on the evaluation test results above were supported by the interview results with the principal, who stated:

> "The students' cognitive abilities in this school are quite good; it can even be said to be above average. It can be seen when students are faced with problems in the form of questions, such as students being able to explain the impact of building houses in mountainous areas, which will reduce water absorption and cause landslides; students can predict the time a forest area will become deforested if every month there is deforestation; students can explain the causes of flooding from an area based on some information or news. It is evident in the students' answers in the assignments."

Based on the observation results, students learned directly with nature. For example, when students learned about plants and plant functions, students would investigate and experiment with dioramas, and they would directly observe erosion and flooding so that they understood that one of the functions of plants is to prevent flooding. Students also learned directly from the natural

environment. For example, when they learned about animal body parts, they would observe directly by catching fish in the pond, then they would dissect it and identify the parts of the fish's body. They also learned the types of bees, bee body parts, nectar and its benefits, and harvest bees from bee cultivation.

Based on the eco-literacy evaluation test results, it was found that the students' cognitive eco-literacy abilities could be categorized as good. It corroborates with the research by Adela, Sukarno & Indriayu (2018), which stated that the ability to understand elementary school students' eco-literacy, especially schools that implemented the Adiwiyata program, could be categorized as very good. Adiwiyata program itself is an environmental education program. However, this study contradicts Iskandar, Rahmawati & Hamdani (2019), which stated that elementary school students' eco-literacy skills in their understanding or cognitive aspects were still low.

The students' cognitive aspects based on the eco-literacy evaluation test were characterized by scientific inquiry skills, method and risk analysis, problem-solving, and critical thinking related to serious environmental issues. It aligns with the opinion of Hollweg et al. (2011) that the cognitive aspects of eco-literacy are characterized by the ability to identify and define environmental problems/issues and analyze them; synthesis and evaluation of information on these problems use primary and secondary sources and one's personal perspective.

In nature school, there were four curricula, and one of them was the cognitive curriculum. The facilitator gave students assignments, making them think logically and analytically so that they completed their assignments and recognized the connection of their knowledge with real-life applications. The learning method used in this natural school was special in its implementation because it was adjusted to each student's growth. The methods employed were discussion, outing class, work with the parent, design project, swimming, and others. Outing classes were usually carried out in natural environments, such as eel docking stations, eco-bricks, and fish docking on the beach. The science projects carried out were like making greenhouses and eco-bricks.

Several factors influence the cognitive aspects of student eco-literacy. According to Rigolon (2012), learning places have an active role in increasing eco-literacy. The closer the students are to the beautiful nature, the higher the level of understanding of eco-literacy. It is in line with the opinion of Koc & Ontas (2020) that meaningful learning that should be in the curriculum for elementary school students is learning that involves students' cognitive activities directly with their learning resources. Another factor that affects the understanding of eco-literacy is the learning material. The learning material must raise environmental issues that are familiar to students to help students think critically and creatively, discuss and find solutions to these problems with natural scientific investigations (Arga & Rahayu, 2019). Moreover, the books provided must also be environmentally based. Eco-literacy books are more suitable for pictorial designs to stimulate imagination and help students understand them (Adriani, Hartati & Kurniawan, 2017; Muthukrishnan, 2019).

3.2. Emotional Aspect

Emotional aspect data were obtained from student questionnaire answers and interview results with students and teachers. The summary of the answers' analysis results to the students' questionnaires can be seen in the following diagram.

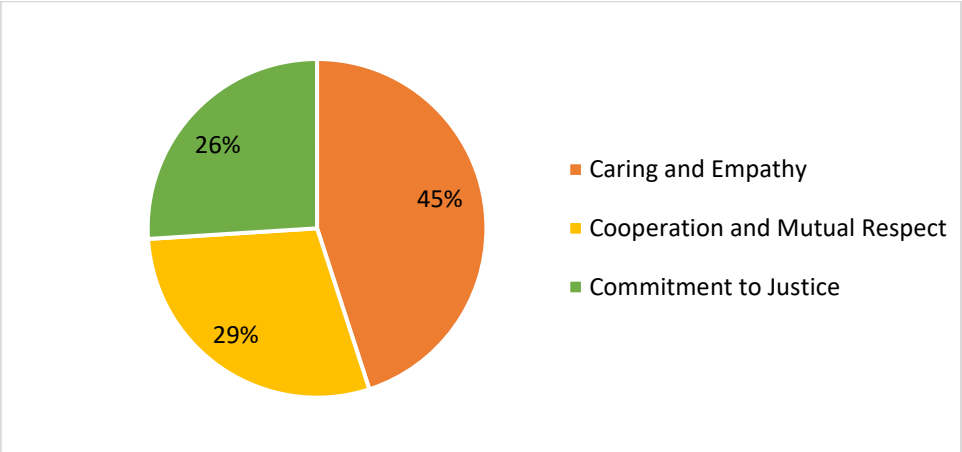

Figure 2. Analysis of emotional aspects of questionnaire data

Based on the information presented in Figure 2, it could be concluded that the indicators that received the highest questionnaire scores were caring and empathy. The emotional aspect of eco-literacy has three indicators. The first indicator is feeling caring, empathy, and respect for other people and sentient beings. The existence of this competency makes students more sensitive to the environment, other people, and living things. Students can feel what other people feel. The observation results showed that students had high empathy by often sharing lunch. In fact, sometimes, some students deliberately asked their parents to make more lunch. It was because, during lunch, students gave and received food from other students, especially students who did not bring food.

Figure 3. Students holding hands

Students' care for their environment was manifested by the act of disposing of garbage properly and awareness of cleaning the school environment. Besides, students also had the awareness to encourage each other. For example, when walking, they would be careful and avoid the plants around them and remind each other of friends. It aligns with the interview results with a third-grade teacher, who stated:

> "Students already have the awareness to dispose of organic and inorganic waste. Here, a separate trash can between organic and inorganic has been provided. Even lower-class students can distinguish between organic and inorganic waste well. They are also aware of the cleanliness of their environment, such as when there is a dirty side of the study room, they will take a broom and clean it without prompting and without aiming to be praised".

Students' empathy for the environment was shown by disposing of trash regularly, while students' empathy for their peers was exhibited by sharing lunch. Empathy is the ability to understand what other people feel, see it from that person's point of view, and imagine oneself in that person's position (Faisal & Ghani, 2015). Empathy greatly determines the direction of a person's life by building social relationships, regulating self-emotion, training in helping behavior, reducing the possibility of stress, and increasing self-achievement (Wahjudi, Findyartini & Kaligis, 2019; Bozkurt & OZden, 2010).

The second indicator is seeing and appreciating different perspectives and working and appreciating other people with different backgrounds, motivations, and judgments. The observation results revealed that students were accustomed to making projects, so they were accustomed to discussing problems raised as the project's main idea, discussing project planning, collaborating in project implementation, and solving problems together. Working and respecting others was also focused on group discussions not only with classmates but also with parents. Routinely, students were given assignments related to critical thinking skills and their analysis with parents. The interview results with the first-grade teacher stated:

> "Teachers routinely give assignments done with parents. For the first graders, their tasks are raising fish at home with their parents, telling them how often they feed them and caring for the fish. Yesterday, there was a fish that died, so we analyze it together. I invited students to think about why fish die, the causes, and the solution".

Figure 4. Students help each other

The observation results showed maturity in other emotional aspects was respecting other people with various backgrounds. Students could mingle with students with special needs and did not discriminate against those who were not the same as their friends in general. It indicated the success of inclusive education, where normal children treated children with special needs homogeneously, and there was no special treatment from the teacher or school (Zimina & Bruxgelevicience, 2016). Students could adept at dealing with differences in groups, shown by interactions in learning, such as discussing and solving problems together. It is because, during group discussions, the interaction between students foster mutual respect, an attitude of democracy; some activities develop thinking, knowledge, and experience, create creative and analytical processes, and practice speaking skills (Meleady, Hopthrow & Crisp, 2012; Stenlund, Jonsson & Jonsson, 2017).

The third indicator is a commitment to equality, fairness, inclusiveness, and respect for all people. Ecologically literate students are active community builders and citizens. Ecological education takes place in the natural environment and local communities. Students can build relationships and apply their understanding in real-world settings. One way to do this is to commit to equality, justice, inclusiveness, and respect for all people, especially in the community. Students have already committed to equality, fairness, inclusiveness, and respect for all school members. Based on the observation results, every morning, before the lesson began, the teacher and students would commit to the Morning Promise. Every morning, students would promise to help friends, protect the environment, clean the environment, and so on, but these promises varied every day according to conditions. Besides, this student's commitment was dominantly shown in peer interaction. The interview results supported this fact with a fifth-grade teacher, who stated:

> "At Bengawan Solo Nature Primary School, we accept students with special needs so that, both from the school, teachers, and peers, these students with special needs are treated equally with other students. Students already understand equality, fairness, and inclusiveness aspects in school by treating their peers equally. No one differentiates; like creating a special gang, it does not exist."

Students were already committed to equality and inclusiveness in all things people. It was displayed by not discriminating between normal friends and friends with special needs. This view of equality showed that the emotional aspects of students were mature. It is supported by the opinions of Joy & Mayhew (2018) and Rajeshwari & Raj (2017), which stated that the emotional aspect of maturity is characterized by the easy flow of love and affection, the ability to judge things positively, and the ability to determine the right behavior towards things that are incompatible with or different from oneself or the environment. These students' emotional maturity was driven by the Morning Promise as a habit that was always done so that every day, they felt that they had an emotional task to do as a form of their responsibility. This fact is reinforced by Kucukkaragoz's (2020) theory that an emotional quotient can be formed through continuous habituation.

3.3. Aspect of Spirit

Similar to the emotional aspect, data on the spiritual aspect were also obtained from student questionnaire answers and the interview results with students and teachers. The summary of the answers' analysis results to the students' questionnaires can be seen in the following diagram.

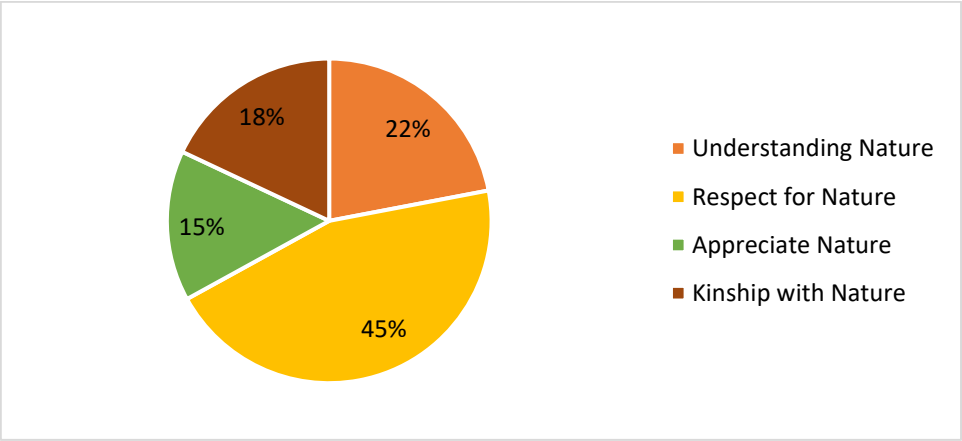

Figure 5. Spirit Aspect Questionnaire Data Analysis

Based on the information displayed in Figure 3, it could be concluded that the indicator that received the highest questionnaire score was kinship with nature.

Figure 6. Students walk without stepping on plants

The spiritual aspect of eco-literacy has indicators in the form of extraordinary experiences to understand nature. Extraordinary experiences can be provided through practical eco-literacy learning. Students learn directly in the wild (environment) and become more meaningful learning. SABS had many activities that provided a great experience to understand nature. The interview results with the principal stated:

"Almost every activity here is related to eco-literacy so that it always interacts directly with nature. It is because, in my opinion, eco-literacy is concerned with the environment. In learning, it means that we learn must involve the environment. We study the environment, so we must go directly to the environment. Besides, it is easier for SABS students to be taught eco-literacy to go directly to nature rather than sit down to do assignments or listen to the subject matter".

The interview results reinforced this fact with a fourth-grade teacher, who stated:

"The way to teach eco-literacy is by holding activities outside. Environmental sensitivity activities are more relevant in the event of an accident like yesterday, several roofs of the huts collapsed. They were taught for community service. The facilitator put aside the material that had to be studied to get the right moment to train students' eco-literacy".

The spiritual aspect in this research was the ability to appreciate the earth and all living things, admire nature, be close to the natural world, and use that feeling to others. The spiritual aspect of students was shown by caring for the environment when learning took place in nature. The students' sensitivity to the environment was naturally shown when they worked together to repair the hut's collapsed roof. It was a student's self-effort to make himself more meaningful to others or the environment. It is in accordance with the theory of Arweck & Nesbitt (2007) and Pandya (2017, stating that a person who has a complete spirituality can make himself have good character, have complete ethics, and be meaningful for the social and family environment.

The next indicator is respect for the earth and any living things in it. Students who have already understood and applied eco-literacy in their daily activities would definitely respect the earth, living things, and everything on earth. The love of protecting and caring for the environment was embedded in students. It was because regularly, students were presented with interesting shows that contained

many meanings to preserve the environment. The interview results with the fifth-grade teacher stated:

"Every day, learning is carried out using interesting learning media, for example, multimedia. We, the facilitators, routinely show learning videos with the theme of the environment; for example, yesterday, I just showed a video of Kampung 3G in Malang, where all the residents emphasize the importance of protecting the environment so that the environment is very beautiful and pleasing to the eye. For today, I want to show a video that has an implicit meaning that the cleanliness of our environment has an impact on personal health".

Figure 7. Students raise bees

Students have also mastered the indicators of spiritual aspects in the form of being able to draw strong bonds and appreciate deeply about a place and connect students with the environment. It was shown by their participation in green lab activities and outing class practices, where students were invited to get involved directly to create a bond with a place, which would later be analyzed and made into knowledge so that solutions were found for the problems that existed in that place. It is in agreement with Preston's (2012) theory that the spiritual aspect is the ability in a person's soul to develop themselves entirely through various positive activities to solve problems and face challenges through the meaning contained in them.

Indicators of spiritual aspects are able to attract strong bonds and appreciate in-depth about a place and be able to connect students with the environment. Natural systems gave students a liking for a place and an understanding of their environment. Students would discover and learn the eco-literacy principles. The interview results with the fifth-grade teacher stated:

"The way we instill a love for the environment in students, one of which is by making green labs or after practicing outing classes, children are invited to think and analyze everything related to the environment, such as analyzing causes, impacts, and solutions".

It was also supported by the interview results with fourth-grade teachers, who stated:

"How to instill a love for the environment is by inviting children to think directly when practicing in the environment. Besides, usually, every morning, the facilitator also tells about nature by making the name of the student as the character so that students are much more interested in listening ".

As for indicators of feeling a kinship with the natural world and showing these feelings with what around them, it was marked by the students' eco-literacy understanding increasing and developing over time. With an increasing understanding of eco-literacy, the students would show a feeling of kinship with nature in the form of daily actions. Besides, this natural school always reflected at the end

of each lesson and was linked with relevant verses to the lesson that day so that students could better understand the meaning of life in the natural world with its relationship to God.

The spiritual aspect was highly emphasized in nature school education, which was marked by a reflection at the end of each lesson linked with relevant verses in the Koran. As educators, they should instill meaningful values in life implicitly in every educational process (Ryndak & Saldaeva, 2020). Additionally, self-reflection in learning can also determine student interest in learning and learning success starting from strategies, models, methods, media, and learning approaches (Tichonova & Schoroskiene, 2013). Therefore, spiritual education is very much needed because it is an effort to equip individuals, which refers to the formation of harmony in relationships, both with themselves, fellow humans and the environment, as well as with God (Hamjah, Rasit & Sham, 2012; Bachtiar et al., 2018).

3.4. Activities

Based on the observation results with the eco-literacy observation sheet, the information listed in the following diagram was obtained.

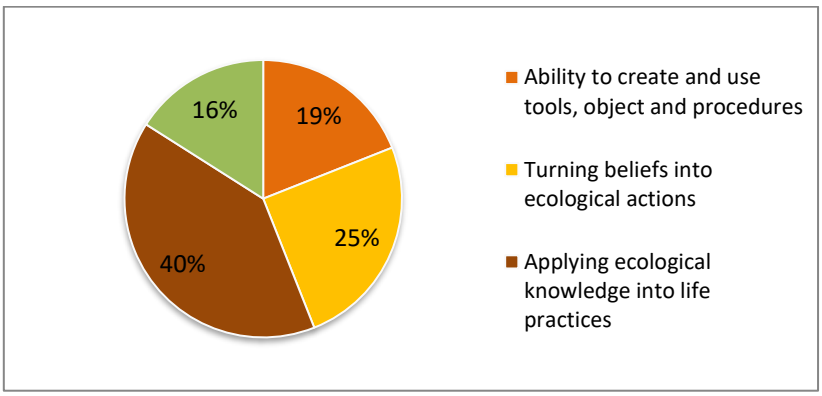

Figure 8. Percentage of students' ecological activities

Based on the information exhibited in Figure 4, it could be concluded that the activity aspect indicator that scored the highest was applying ecological knowledge into life practices.

The first indicator for the activity aspect is creating and using tools, objects, and procedures needed by the community. Based on the observation results, students already could create or use tools, objects, and procedures needed by the community. For example, when students found a leaky pipe, students would consciously look for items that could leak the pipe, stopping using the tools and objects around them. Students could also design windmills for power generation in project-based learning, modify tools to water plants automatically, and make a blender. The student's ability is an eco-literacy activity, where this activity is a form of developing practical learning skills and working physically, such as building, planting, and improving the environment (Singleton, 2015). Experiences like the above were included in meaningful eco-literacy education, which can stimulate student activities towards environmental love (Jagannathan, Camasso & Delacalle, 2018).

The next indicator is applying ecological knowledge to life practices. Based on the observation results, each student had an ornamental plant planted next to the class. Students consciously and regularly took turns watering and fertilizing the ornamental plants. Not only with plants, students also got knowledge of ecology for raising, cultivating catfish to bees, which they then applied in their daily lives. Besides, when students learned about healthy and unhealthy environments, they also had the initiative to make bins from woven bamboo, which were then placed in houses, which according to

them, were lacking. It indicated that these students had a provision of ecological knowledge provided by the teacher, which was then applied in life practice.

Students have become skilled at applying ecological knowledge into life practices, which was exposed by the students' conscious behavior to care for ornamental plants based on the knowledge they gained during learning. Humans who have ecological knowledge and apply it well will understand every behavior and action, not only having an impact on themselves and others but also on the natural environment in which they live, which must be maintained so that they still have the carrying capacity for the lives of themselves, others, and their environment. (Horton, & Horton, 2019; Boafo et al., 2015). This opinion is also supported by the opinion of Orr (2011) that someone who has ecological knowledge and can apply it in everyday life must know how to relate and behave with their ecosystem.

In the activity indicator in the form of assessing and adjusting the use of energy and natural resources, students had the skills to assess and an awareness of the use of energy and natural resources. The observation results uncovered that students had the awareness to turn off the lights when they were not needed, even though for students with special needs, some did not yet have this awareness. It was supported by the interview results with teachers who stated:

> "At Bengawan Solo Nature Primary School, the weather often changes at a time. For example, sometimes, it is cloudy in the morning, later in the afternoon it is very hot, then after that, suddenly, the sky becomes dark again and cloudy. Here, students are aware of when they need lights and when they do not need them. Students have an awareness of energy-saving; likewise, with fans or other electronic devices. However, there are indeed some students with special needs who have not shown awareness of energy saving. "

This fact was reinforced by the interview results with parents who stated:

> "Children have the awareness to turn off the lights, air conditioner, and TV when they are not in use. Then, another example, when doing ablution (wudhu), they will save water. Unlike children in general who like to play with water, they will close the faucet and continue their activities when they finish doing ablution."

Figure 9. Students always carry drinking bottles

Figure 10. Students always keep clean

The next indicator of student ecological activity was to assess the use of energy and natural resources, indicated by the awareness of students turning off lights, TV, air conditioning, and fans when not in use, both at school and home. Besides, students were also aware that they always carried a drink bottle to reduce the use of plastic when they had to buy drinks. This student behavior is the active participation of students in eco-literacy addressed through specific actions, activities, or lifestyles, including environmentally friendly consumer purchases, using methods to conserve resources, assisting in the enforcement of environmental regulations, using personal and interpersonal ways to promote environmentally sound practices and support environmental policies and legislative initiatives (Alexandar & Poyyamoli, 2014; Veselinovska & Osogovska, 2012).

4. Conclusion and Recommendations

Based on the research results and discussion, it could be concluded that (1) the cognitive aspects of most students were classified as good, indicated by a systematic understanding of nature. (2) The students' emotional aspects were good, signified by caring and empathy, cooperation and mutual respect, and commitment to student justice, which was evident in every activity. (3) Students' spiritual aspects were categorized as good, shown by respecting nature, understanding nature, appreciating nature, and kinship with nature, both in learning and activities outside of learning. (4) The students' active ecological activity was displayed by proficiently applying ecological knowledge into life practices, the ability to convert beliefs into ecological actions, the ability to create and use high tools, objects, and procedures, and the ability to assess and adjust the use of energy and natural resources, both at home and school. Based on these aspects, the profile of eco-literacy ability in nature schools was quite good.

The study recommends educators, teachers, and counselors to focus on the eco-literacy of students because to introduce and renew one's understanding of the importance of global ecological awareness to create a balance between society's needs and the earth's ability to sustain them. Eco-literacy also plays a crucial role in instilling awareness in children about the importance of protecting the environment and forming social awareness and sensitivity to the surrounding environment so that environmental damage can be prevented. The results showed that students' eco-literacy in nature schools were very good. It recommended to investigate this trend among public schools or private schools in different countries.

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